

Moving along south Florida's Currents

Just think if you were a tiny juvenile fish or a piece of driftwood floating off the south Florida coast. Where would you end up? How would you get there? Physical oceanographers study the movement of ocean water or currents and record the average flow worldwide. Ocean currents are organized water flows that persist in some geographical region and over time, that water is transported from ocean to another. Currents also are responsible for transporting plankton, fish, heat, chemicals, and even driftwood. Surface and oceanic currents are responsible for the general pathway and direction and connect the entire coastal ecosystem in south Florida by a predetermined path.

Gulf Stream Current

Most of us are familiar with the Gulf Stream, which flows along the entire east coast of the United States. The Gulf Stream is a steady northbound surface current that carries Atlantic Ocean water into the Norwegian Sea. It has long been known by mariners, who have used its flow patterns for ocean travel and have been humbled by its power. This steady current is the confluence of a number of southern currents that mix the tropical South Atlantic waters with those of the Caribbean Sea and the Gulf of Mexico. The Gulf Stream has its origin in the ocean south of Florida. From there, it flows northwards along the Eastern Coast of the United States, crosses over the North Atlantic between 40 and 50 degrees Northern latitude, and comes into the Norwegian Sea between the Faeroe Islands and Great Britain. In the Norwegian Sea, the current's correct name is the Norwegian Current. Off the coast of Troms County, it divides in two and continues as the West Spitsbergen Current past Svalbard and the North Cape Current in the Barents Sea. To simplify things, the name "Gulf Stream" is also used in the Norwegian Sea.

Loop Current

One of the primary currents that create the Gulf Stream is the Loop Current of the Gulf of Mexico. Waters moving up from the Caribbean Sea and washing the Yucatan peninsula feed into the Gulf of Mexico. This current varies widely and can extend into the Mississippi delta or just barely venture north and east of the Dry Tortugas. This giant loop then moves water back out of the gulf and into the Florida Straits.

Florida Current

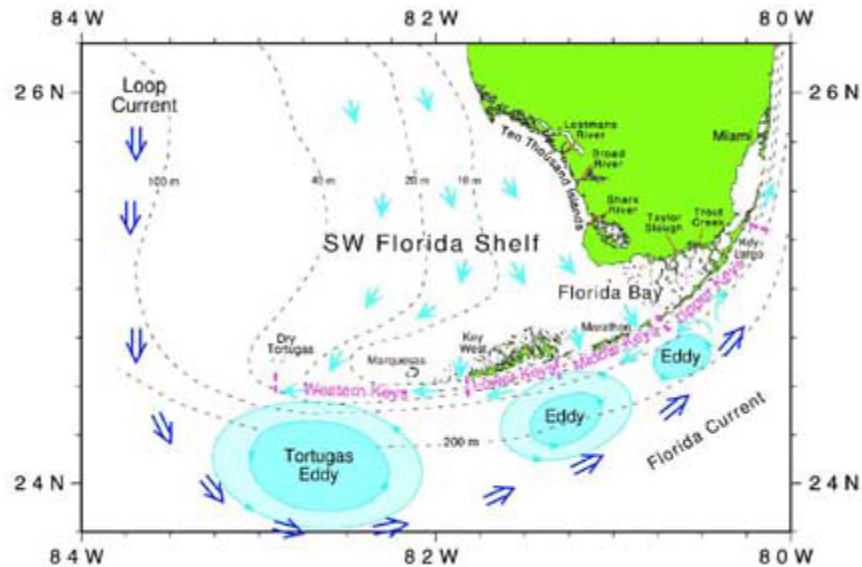
The second major current that feeds the Gulf Stream is known as the Florida Current. It is the section of the system that stretches from the Florida Straits up to Cape Hatteras. It is sometimes also referred to as the beginning of the Gulf Stream current. The Florida current flows through the Straits of Florida and joins the Antilles Current just off the tip of Florida.

Gyres or Eddies

In addition, smaller circular currents called gyres or eddies form near the Keys. Created by temperature variations in the major currents, these counter clockwise currents circulate cooler water, providing some unique circumstances for the recruitment of marine

organisms. According to scientists from the National Oceanic and Atmospheric Administration and the University of Miami Rosenstiel School of Marine and Atmospheric Science, these currents are important in retaining marine larvae (such as fish, pink shrimp, and spiny lobster) spawned in the Keys and also for receiving new recruits from the Caribbean.

When you look at a map of Florida, it seems as if "downstream" is an easy concept to understand. The south Florida watershed, also known as the Kissimmee-Okeechobee-Everglades (KOE) watershed, flows slowly southward from the Kissimmee River basin,



through the Everglades, out through Florida Bay, passes through the chain of islands of the Florida Keys and flows over the reef tract to join the Florida Current and the Gulf Stream. Sometimes forgotten is that these northward flowing currents also make south Florida part of the "downstream" from the Caribbean and South America. The Florida Keys is not only affected by activities related to Everglades restoration and the Gulf of Mexico, but also practices in the Caribbean and South America due in large part to these huge, steady ocean currents flowing up from the tropics. Florida is inescapably part of an interconnected system, on the local, regional, and global scale. As we are sometimes the lucky recipients (lobster, fish, and coral recruits) and sometimes the not so lucky recipient of pollutants from remote sources.

For more information on currents visit: <http://oceancurrents.rsmas.miami.edu> or contact: Alex Score, Education and Outreach Coordinator, South Florida Ecosystem Education Project, University of Florida – Sea Grant Extension PO Box 1083, Key Largo, FL 33037, 305-852-7717 ext 23, afscore@ifas.ufl.edu.